ABSTRACT

A detection system for detecting unusual or unexpected conditions in an environment monitored by one or more sensors generating a data samples for input to the detection system. The detection system includes a predictive signal processor that identifies unexpected data samples output by the sensors. The predictive signal processor includes at least one prediction model M for predicting subsequent data samples of a data stream S input to M from the sensors. M uses past sensor data samples of S that correspond anticipated environmental conditions for iteratively predicting a subsequent likely sensor data sample from S. If there is a sufficient variance between the actual subsequent sensor data of S, and it's corresponding prediction, then a likely event of interest is identified. When the predictive signal processor is not detecting a likely event of interest due to a prediction by M, M iteratively adapts its predictions according to the most recent input data samples. When the predictive signal processor detects a likely event of interest due to a prediction by M, M does not use the data samples received during the detection for determining subsequent predictions. Thus, M processes its stream of data samples differently depending on a variance in its prediction from the corresponding actual data sample.